

AMENDMENTS TO THE CLAIMS

Claim 1. (Currently Amended) An interpolation synchronous detection method in a radio communication system in which a pilot symbol whose phase point is known is periodically inserted in an information signal to allow interpolation synchronous detection on a receiving side, comprising:

synchronous detection of the information between the pilot symbols, contained only in a received signal, by linearly interpolating a transfer function estimated from the pilot symbols respectively located before and after the information signal, and a reception sampling point timing used for the synchronous detection is updated at a middle point between the pilot symbols respectively located before and after the information signal, wherein oversampling occurs at the sampling point that coincides with a maximum eye pattern between the pilot symbols and phase error is minimized by changing the transfer function at the sampling point.

Claim 2. (Currently Amended) An interpolation synchronous detection method in a radio communication system in which a pilot symbol, contained in a received signal, whose phase point is known is periodically inserted in an information signal to allow interpolation synchronous detection on a receiving side, comprising:

using a transfer function wherein when said transfer function of a transmission/reception circuit used in said radio communication system is changed stepwise, the transfer function of said transmission/reception circuit is changed at a middle point between the pilot symbols, contained only in the received signal,

respectively located before and after the information signal, wherein oversampling occurs at the middle point coincides with a maximum eye pattern between the pilot symbols and phase error is minimized by changing the transfer function at the sampling point.

Claim 3. (Original) A method according to claim 2, wherein the transfer function is changed stepwise by switching a gain range of a transmission/reception section used in said radio communication system.

Claim 4. (Currently Amended) A radio communication system in which pilot symbols whose phase points are known are periodically inserted in two ends of an information signal having predetermined bits to allow interpolation synchronous detection on a receiving side, comprising:

interpolation means for performing synchronous detection of the information signal between the pilot symbols, contained only in a received signal, by linearly interpolating a transfer function estimated from the pilot symbols respectively located before and after the information signal on the receiving side;

means for performing interpolation synchronous detection by using a complex conjugate of the linearly interpolated transfer function; and

processing means for selecting a sampling point, at a middle point between the pilot symbols, at which an eye pattern opens most from a result obtained by discretely oversampling the reception signal, thereby demodulating the reception signal, wherein the oversampling point coincides with a maximum eye pattern between the pilot symbols and phase error is minimized by changing the transfer function at the sampling point.

Claim 5. (Currently Amended) A radio communication system in which pilot symbols, contained only in a received signal, whose phase points are known are periodically inserted in two ends of an information signal having predetermined bits to allow interpolation synchronous detection on a receiving side, comprising:

a transfer function changing section for changing a transfer function of a transmission/reception section in said radio communication system stepwise; and

a transfer function control section for changing a transfer function of said transfer function changing section at a middle point between the pilot symbols, contained in the received signal wherein the midpoint coincides with a maximum eye pattern and phase error is minimized by changing the transfer function at the sampling point.

Claim 6. (Original) A system according to claim 5, wherein said transfer function changing section comprises a gain changing section capable of switching a variable gain range, and said transfer function control section comprises a gain control section.

Claim 7. (Currently Amended) A radio communication system in which pilot symbols whose phase points are known are periodically inserted in two ends of an information signal having predetermined bits to allow interpolation synchronous detection on a receiving side, comprising:

an interpolator performing synchronous detection of the information signal between the pilot symbols, contained in a received signal, by linearly

interpolating a transfer function estimated from the pilot symbols respectively located before and after the information signal on the receiving side;

an interpolator performing synchronous detection by using a complex conjugate of the linearly interpolated transfer function; and

a processor for selecting an oversampling point, at a middle point between the pilot symbols, coinciding with a point between the pilot symbols at which an eye pattern opens most from a result obtained by discretely oversampling the reception signal, thereby demodulating the reception signal wherein phase error is minimized by changing the transfer function at the sampling point.

Claim 8. (Currently Amended) A method of performing interpolation synchronous detection using pilot symbols comprising:

linearly interpolating a transfer function estimated from the pilot symbols, the pilot symbols located before and after an information signal;

sampling at an oversampling timing point for synchronous detection at a middle point between the pilot symbols, the sampling point being dynamically updated based on the linear interpolation of the transfer function estimated from the pilot symbols,

wherein a reference phase error and a reproduced data error rate are minimized wherein the oversampling point coincides with a maximum eye pattern between the pilot symbols and phase error is minimized by changing the transfer function at the sampling point.